

Notice of Allowability

Application No.

10/690,088

Examiner

Henry S. Hu

Applicant(s)

KASPAR ET AL.

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1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE of December 7, 2005.
2. ☒ The allowed claim(s) is/are 1-13.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 7-18-2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. Applicants' faxed **Request for RCE (with Amendment after Final)** filed on December 7, 2005 was received. It is noted that such a claim amendment was filed in response to the Examiner's 2nd non-final office action. Claims 1 and 4 were amended; Claim 14 was cancelled, while no new claim was added. To be more specific, parent **Claim 1** was amended to incorporate two things as (A) the limitation of dependent Claim 14 for the amount of hydrocarbon olefin, and (B) the fluorinated liquid has a boiling point of at least 50 °C, while **Claim 4** was amended to use only **a perfluorinated liquid**. The Applicants allege that support of claim amendment is as disclosed in detail on the top section of page 5 in Remarks. **Claims 1-13 are now pending** with only one independent claim (Claim 1). An action follows.

2. Two claim rejections under 35 USC 103(a) rejection in previous Office Action filed on July 7, 2005 are now removed for the reasons given in paragraphs 3-11 thereafter.

Allowable Subject Matter

3. Claims 1-13 are allowed.

4. The following is an examiner's statement of reasons for allowance: The above Claims 1-13 are allowed over the closest references:

5. The limitation of amended parent **Claim 1** of present invention relates to **a process comprising polymerizing a fluorinated olefin and a hydrocarbon olefin selected from ethylene, propylene and mixtures thereof, to give a copolymer, wherein polymerizing is a substantially emulsifier free aqueous emulsion polymerization in the presence of “fluoropolymer particles” and/or in the presence of “fluorinated liquid” having a boiling point of at least 50°C, wherein said copolymer contains recurring units deriving from the hydrocarbon olefin in an amount of 10 to 70 mol% relative to the total amount of recurring units in the copolymer.**

See other limitations of dependent Claims 2-13.

6. In view of the Applicants' RCE request filed on December 7, 2005 with Amendment (after final) filed on November 4, 2005, parent **Claim 1** was “further” amended to incorporate two things as: **(A) the limitation of dependent Claim 14 for the amount of hydrocarbon olefin, and (B) the fluorinated liquid has a boiling point of at least 50 °C,** while dependent **Claim 4** was amended to use only **a perfluorinated liquid.** Parent **Claim 1** is related to a copolymerization process to make **a copolymer of fluorinated olefin and hydrocarbon olefin,** wherein a combination of a **substantially emulsifier free aqueous emulsion polymerization** and the presence of “**fluoropolymer particles**” and/or “**fluorinated liquid**” are required to improve the copolymerization.

7. Regarding the two **103(a) rejections**, each of the two primary references including McCarthy and Oxenrider has disclosed **surfactant-free copolymerization** but is silent about

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adding **fluorinated liquids and/or fluoropolymer particles** in the polymerization process. In a very close examination, McCarthy has disclosed the preparation of a stable aqueous **self-dispersible** fluorinated copolymer dispersion by **surfactant-free** aqueous emulsion polymerization of a combination of fluoroolefin(s) and nonfluoroolefin(s) to obtain up to 48% polymer solids in water due to improved conversion rate of monomer to polymer. Oxenrider has disclosed the preparation of stable aqueous fluorinated copolymer dispersion by **surfactant-free** aqueous **“suspension polymerization”** of a combination of fluoroolefin(s) and nonfluoroolefin(s) due to improved wettability of polymer particles. It is known in the art that a **suspension polymerization would produce quite different polymers in comparison with that from an emulsion polymerization.**

The secondary reference Tournut et al. in both 103 rejections may have disclosed **an inactive halogenated saturated hydrocarbon such as difluorochloromethane or trifluorotrichloroethane useful as a stabilizing agent can be presented in the aqueous emulsion polymerization with the polymerizable fluorinated monomer in order to obtain a stabilized aqueous dispersion and a lower molecular weight since such a halocompound can also be generally useful as chain transfer agent** (column 2, line 10-31 and 50-68; abstract, line 1-15). However, surfactant or emulsifier is required in Tournut's polymerization process as specifically pointed out by the Applicants on pages 5-6 of Remarks (also see column 2, line 31-39). In summary, Tournut fails to teach or fairly suggest using a **surfactant-free aqueous emulsion polymerization**. Therefore, a motivation to link the involved references including McCarthy and Oxenrider for the issue of “surfactant free” is lacking.

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8. In a close examination of the four references cited in the **search report for Applicants'** **PCT/US03/33233 (now is WO 2004/041878 A1 to Kaspar et al.)** as disclosed in two **IDS of 1-22-2004 and 5-3-2004**, the examiner confirms that **EP-320,156 A2 to Yeates et al.** (cited as X), **WO-97/17,381 to McCarthy et al.** (cited as X), **US 4,277,586 to Ukihashi et al.** (cited as X) and **EP-446,725 A1 to Carlson, Dana P.** (cited as X) all fail to teach or fairly suggest such a combination of process limitations.

To be more specific, “**381**” is a PCT of the above-mentioned McCarthy et al. (US 5,955,556), it has therefore the same deficiency; “**586**” requires the use of a fluorinated surfactant (see column 6, line 29-62), but no claimed fluoropolymer particle or fluorinated liquid is used; “**725**” uses a fluorinated solvent in the process (page 4, line 34-40) but also requires the use of fluorinated surfactant (see page 4, line 12-15); while “**156**” is only a process to polymerize at least one vinyl monomer to form **a non-fluorinated vinyl polymer** (see page 4, line 26-45) in the presence of an aqueous based surfactant-free emulsion of fluoropolymer having a chain-pendant functional groups (see page 2, line 40-48).

Additionally, the present invention has shown in examples along with some comparative examples for making such a emulsifier-free polymerization to prepare copolymers of **fluorinated olefin and hydrocarbon olefin** the presence of “**fluoropolymer particles**” and/or “**fluorinated liquid**” (see pages 16-19 for **examples 1-5** with comparative examples).

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Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

9. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

US Patent No. 6,693,152 B2 to Kaspar et al. discloses an emulsifier free fluoropolymer manufacturing method in which a mixture of an oxidizing agent and reducing agent is used to initiate the polymerization (abstract, line 1-7). However, Kaspar is silent about adding **any of fluorinated liquids and/or fluoropolymer particles** in the polymerization process. Therefore, no claimed process is disclosed.

US Patent No. 5,001,278 to Oka et al. disclose that the molecular weight of TFE-related (may include hydrocarbon monomer, see column 1, line 18-20) elastomeric copolymers can be easily controlled by the addition of a "liquid" **chain transfer agent** such as a **C₄₋₆ hydrocarbon**, an alcohol, an ether, and a halogen-containing organic compound such as CCl₄, CBrCl₃, CF₂BrCFBrCF₃ and CF₂I₂ (column 4, line 62-67). Although aqueous emulsion polymerization may be used (column 4, line 42-47), **solvent polymerization is preferable**. Additionally, **no claimed boiling point or the mol% of hydrocarbon monomer is disclosed.**

10. The key issue, regarding a copolymerization process to make **a copolymer of fluorinated olefin and hydrocarbon olefin** (10-70 mol%), wherein a combination of a

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substantially “emulsifier free” aqueous emulsion polymerization and the presence of “fluoropolymer particles” and/or “fluorinated liquid having a boiling point of at least 50 °C” are required to improve the copolymerization, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

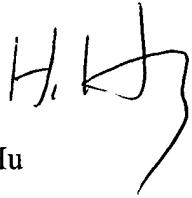
11. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the independent process **Claim 1** is allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 2-13** are passed to issue.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, David Wu, can be reached on (571) 272-1114. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

January 23, 2006



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